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Louis P. Herzberg Intellectual Property Law Dept. IBM Corporation P.O. Box 218 Yorktown Heights, NY 10598				
EXAMINER				
KRISHNAN, VIVEK V				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/776,705

Applicant(s)

EILAM ET AL.

Examiner

VIVEK KRISHNAN

Art Unit

2145

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-14 and 16-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-14 and 16-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

This is a Non-Final Office Action Correspondence in response to U.S. Application No. 10/776705 filed on February 11, 2004. Claims 1-10, 12-14, and 16-21 are pending.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 16-18, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 7,050,807 to Osborn (hereinafter "Osborn") and U.S. Patent Application Publication No. 2002/0186238 A1 to Saylor et al. (hereinafter "Saylor").

3. As to Claims 1 and 17, Osborn discloses a method for provisioning in a computing utility infrastructure, the method comprising:

obtaining a Concrete Resource Model describing a desired resource structure having nodes [...] (Osborn; Figure 2, column 3 lines 60-67, and column 4 lines 1-15, discloses obtaining an abstract resource description describing virtual hardware resource objects which identify application hardware requirements), said nodes representing resources and requirements on a state of said resources (Osborn; Figures 9 and 11, nodes representing resources and resource groups), [...] attributes describing a type of a relationship and describing whether said

relationship is fixed or dynamic, [...] said attributes indicating whether said relationship must exist or not (Osborn; Figures 9 and 11, and column 6 lines 3-44 and column 7 lines 27-64, using association labels and resource grouping to indicate whether a relationship is fixed or dynamic/required or not), and said type of said relationship comprising one or more of: a first resource uses a second resource to perform a function, a first resource is a runtime container for a second resource, a first resource and a second resource are connected to communicate each other, a first resource is a federation of other resources including a second resource, and a first resource includes a second resource and the first resource is a set of homogeneous resources (Osborn; column 4 lines 23-51, relationship between resources describing dependencies, i.e. a resource using another to perform a function and connected to communicate with each other); and

using the Concrete Resource Model to generate at least one provisioning action to create a matching resource structure in the computing utility infrastructure (Osborn; Figure 2, column 3 lines 60-67, and column 4 lines 1-15, discloses using the abstract resource description to create a matching resource structure, by mapping available hardware resources to the abstract resource description. It is inherent for an operating system, as disclosed by Osborn, to generate at least one task, or provisioning action, to create the matching resource structure.).

Osborn does not explicitly disclose, however Sylor discloses a resource structure with nodes and edges, said edges representing relationships between said resource (Sylor; paragraph 87).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the concrete resource model including nodes, as disclosed by Osborn, to

include edges, as disclosed by Sylor, in order to use dependency relationships to organize and monitor resources.

Osborn and Sylor do not explicitly disclose said attributes including color attributes, however official notice is taken that using a coloring scheme to visually indicate attributes as modified over association labels and resource groupings (disclosed by Osborn) would be obvious to one of ordinary skill in the art at the time the invention was made.

4. As to Claim 16, Osborn and Sylor disclose each and every limitation of Claim 1. Osborn further discloses a program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for provisioning in a computing utility infrastructure, said method steps comprising the steps of claim 1 (Osborn; column 3 lines 44-67, column 4 lines 1-15, column 7 lines 35-45, and Figure 2, discloses implementation on a hardware system comprising code to implement the provisioning).

5. As to Claim 18, Osborn and Sylor disclose each and every limitation of Claim 17. Osborn further discloses a computer program product comprising a computer usable medium having computer readable program code means embodied therein for causing provisioning in a computing utility infrastructure, the computer readable program code means in said computer program product comprising computer readable program code means for causing a computer to effect the functions of claim 17 (Osborn; column 3 lines 44-67, column 4 lines 1-15, column 7

lines 35-45, and Figure 2, discloses implementation on a hardware system comprising code to implement the provisioning).

6. As to Claim 20, Osborn and Saylor disclose each and every limitation of Claim 1. Osborn further discloses wherein the steps of obtaining and using are performed by at least one user taken from a group of users consisting of:

- a service provider;

- an enterprise owning an infrastructure used for running at least one application (Osborn; column 3 lines 1-15 and column 8 lines 12-23, discloses an application developer);

- a customer of a service provider;

- a company owning an IT infrastructure (Osborn; column 3 lines 1-15 and column 8 lines 12-23, discloses an application developer); and

- a utility provider (Osborn; column 3 lines 1-15 and column 8 lines 12-23, discloses an application developer).

7. As to Claim 21, Osborn and Saylor disclose each and every limitation of Claim 20. Osborn further discloses wherein at least one of said at least one user provides operational constraints dictating acceptable variations (Osborn; column 3 lines 1-15 and lines 60-67, discloses the application specification, provided by the application developer, that provides operational constraints).

8. Claims 2, 3, 7, 8, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osborn and Saylor, as applied to Claim 1 above, and in further view of U.S. Patent No. 6,332,023 B1 to Porter et al. (hereinafter "Porter").

9. As to Claim 2, Osborn and Saylor disclose each and every limitation of Claim 1. Osborn further discloses wherein the step of using the Concrete Resource Model includes executing at least one phase comprised of a matching step, wherein the step of matching is repeated until the Concrete Resource Model is entirely matched with a set of at least one Resource Instance Service in a knowledge subsystem describing resources and organization of resources in the computing facility infrastructure (Osborn; column 6 lines 65-67 and column 7 lines 1-25 and Figure 8, discloses that using the abstract resource description, or application hardware resource specification, includes matching the application hardware resource specification with the hardware resource diagram).

Osborn does not explicitly disclose, but Porter discloses a configuring step as recited in the claim (Porter; column 3 lines 30-40).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Osborn's disclosure of a matching step to include a configuring step in order to provide for a more flexible allocation of resources (Porter; column 2 lines 35-54).

10. As to Claim 3, Osborn, Saylor, and Porter in combination disclose each and every limitation of Claim 2. Osborn further discloses wherein the step of matching includes mapping every node in a subset of said nodes in the Concrete Resource Model to a Resource Instance Service in the knowledge subsystem, such that for every node in said subset, constraints on

values of said attributes in said node are satisfied by the values of the same attributes in the corresponding Resource Instance Service, and the set of said relationships between said nodes in said Concrete Resource Model matches the set of relationships between the corresponding Resource Instance Services (Osborn; Figure 8, Figure 9, column 6 lines 45-67, and column 7 lines 1-25, discloses matching the application hardware resource specification to the hardware resource diagram by parsing the definitions and constraints of the application hardware resource specification that include information regarding fixed attributes and relationships).

11. As to Claim 7, Osborn and Saylor disclose each and every limitation of Claim 1. In addition, Osborn and Porter disclose wherein the step of generating at least one provisioning action includes at least one task taken from a group of tasks consisting of:

- creating a new service environment (Osborn; column 3 lines 60-67, discloses allocating resources to an application to create a service environment);

- changing a combination of resources allocated to the service environment (Osborn; column 3 lines 60-67, discloses allocating resources to an application to create a service environment) (Porter; column 3 lines 40-50, discloses de-allocating resources allocated to a service environment);

- changing the configuration of resources allocated to a service environment (Porter; column 3 lines 30-40, discloses changing the configuring of a resource that has been allocated to a service environment);

- destroying a service environment; and

- any combination of these tasks.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Osborn's disclosure of provisioning to include the ability to change the configuration of resources in order to provide for a more flexible allocation of resources (Porter; column 2 lines 35-54).

12. As to Claim 8, Osborn, Saylor, and Porter disclose each and every limitation of Claim 7. Porter further discloses wherein changing the configuration of resources allocated to a service environment includes at least one of:

changing a local state of a resource (Porter; column 1 lines 66-67, column 3 lines 1-20, discloses updating static and dynamic resource attributes); and

changing a way the resource is configured to work with other resources.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Osborn's disclosure of provisioning to include the ability to change the configuration of resources in order to provide for a more flexible allocation of resources (Porter; column 2 lines 35-54).

13. As to Claim 19, Osborn, Saylor, and Porter disclose each and every limitation of Claim 2, Osborn further discloses wherein said at least one phase is a Concrete Model Processing Engine phase, the Concrete Model Processing Engine phase, comprising:

receiving requests in the form of a Concrete Resource Model describing a desired resource structure (Osborn; column 3 lines 60-67, discloses a hardware resource manager that

receives requests in the form of an abstract resource description describing virtual hardware resource objects which identify application hardware requirements); and

generating provisioning actions for reaching a state that satisfies the requirements specified in the Concrete Resource Model (Osborn; column 3 lines 60-67, discloses the hardware resource manager creating a matching resource structure to satisfy the requirements of the abstract resource description).

14. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osborn, Saylor, and Porter, as applied to Claim 2 above, in further view of U.S. Patent No. 4,980,824 to Tulpule et al. (hereinafter "Tulpule").

15. As to Claim 4, Osborn, Saylor, and Porter disclose each and every limitation of Claim 2. Osborn and Porter further disclose updating the knowledge subsystem with side effects of the provisioning action, said side effects of the provisioning action comprising: creating the relationships between the resources (Osborn; Figure 10), destroying the relationships between the resources, and changing values of the attributes in corresponding Resource Instance services (Porter; column 3 lines 30-40).

Osborn, Saylor, and Porter do not explicitly disclose, however Tulpule discloses wherein the step of configuring includes:

collecting provisioning actions to a provisioning action set (Tulpule; column 2 lines 55-65, discloses collecting tasks to a queue);

selecting a provisioning action having all preconditions satisfied (Tulpule; column 2 lines 55-65 and column 3 lines 24-26, discloses selecting tasks having all prerequisites met);

executing the provisioning action (Tulpule; column 3 lines 24-26, discloses executing the tasks); and

repeating the steps of selecting and executing until all provisioning actions whose preconditions are satisfied are executed (Tulpule; column 3 lines 24-26, discloses selecting tasks whose prerequisites are satisfied for placement in a queue for execution).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Porter's disclosure of a configuring step to include collecting, selecting, and executing tasks for provisioning in order to provide a task executive that takes into account task dependencies and prerequisites (Tulpule; column 2 lines 23-34).

16. As to Claim 5, Osborn, Saylor, and Porter in combination disclose each and every limitation of Claim 2. Osborn, Saylor, and Porter do not explicitly disclose, but Tulpule discloses, wherein the step of configuring includes

selecting a provisioning action from a provisioning action set having at least one precondition not satisfied (Tulpule; Figure 4, Figure 5, and column 12 lines 29-47, discloses dependency table and prerequisite table that are used to determine tasks with preconditions satisfied and tasks without preconditions satisfied),

finding a different action to satisfy said at least one precondition (Tulpule; column 12 lines 29-47, discloses selecting a different task that satisfies the prerequisite); and

adding said different action to said provisioning action set (Tulpule; column 12 lines 29-47, discloses selecting a different task that satisfies the prerequisite and placing the task in a queue for execution).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Osborn and Porter's disclosure of a configuring step to include providing a task to satisfy the preconditions of another task in a set in order to provide a task executive that takes into account task dependencies and prerequisites (Tulpule; column 2 lines 23-34).

17. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Osborn, Sylor, Porter, and Tulpule, as applied to Claim 4 above, and in further view of, and U.S. Patent No. 4,648,031 to Jenner (hereinafter "Jenner").

18. As to Claim 6, Osborn, Sylor, Porter, and Tulpule disclose each and every limitation of Claim 4. Osborn, Sylor, Porter, and Tulpule do not explicitly disclose, however Jenner discloses obtaining said side effects of said provisioning action by at least one of:

inspecting the definition of said provisioning action in said knowledge subsystem; and
dynamically discovering the side effects once the action is executed by executing a discovery component (Jenner; column 2 lines 4-10, discloses a recovery log that is updated with side effect information when a task is executed).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tulpule's disclosure of executing the task to include updating the system with the side effects of the task in order to facilitate system recovery (Jenner; column 1 lines 55-65).

19. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osborn and Saylor, as applied to Claim 1 above, and in further view of U.S. Patent Application Publication No. US 2004/0128397 A1 to Glasmann et al. (hereinafter "Glasmann").

20. As to Claim 9, Osborn and Saylor disclose each and every limitation of Claim 1. Osborn and Saylor does not explicitly disclose, but Glasmann discloses regenerating provisioning instructions whenever at least one of the following occurs:

infrastructure characteristics change (Glasmann; paragraph 5, 8, and 9, discloses allocating resources when there is a change in the topology); and
requirements of the service change; and
Provider's policy change.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Osborn's disclosure of provisioning resources to include providing resources when infrastructure characteristics change in order to provide for adaptive resource checking and reacting to topology changes (Glasmann; paragraphs 7 and 10).

21. As to Claim 10, Osborn and Glasmann in combination disclose each and every limitation of Claim 9. Glasmann further discloses wherein infrastructure characteristics are taken from a group of characteristics consisting of:

- types of resources in the infrastructure;
- capabilities of said resources (Glasmann; paragraphs 4 and 5, discloses topology changes include changes in the capabilities of a resource);
- configuration of said resources (Glasmann; paragraphs 4 and 5, discloses topology changes include changes in the configuration of a resource);
- constraints on a configuration of said resources; and
- any combination of these characteristics.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Osborn's disclosure of provisioning resources to include providing resources when infrastructure characteristics change in order to provide for adaptive resource checking and reacting to topology changes (Glasmann; paragraphs 7 and 10).

22. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Osborn and Saylor, as applied to Claim 1 above, and in further view of U.S. Patent No. 6,901,446 B2 to Chellis et al. (hereinafter "Chellis").

23. As to Claim 12, Osborn and Saylor disclose each and every limitation of Claim 1. Osborn and Saylor do not explicitly disclose, but Chellis discloses wherein said concrete resource model

provides a set of resource manager methods taken from a group of resource manager methods consisting of:

creating composite resources based on a Concrete Resource Model (As mentioned above, Osborn does disclose a resource manager for a composite resource. Chellis; column 3 lines 36-59, discloses a resource manager capable of creating a composite resource, or set of interdependent resources, based on defined resource requirements for a service);

changing composite resources based on a Concrete Resource Model (As mentioned above, Osborn does disclose a resource manager for a composite resource. Chellis; column 3 lines 36-67 column 4 lines 1-27 and column 9 lines 55-67, discloses a resource manager capable of changing a composite resource, or set of interdependent resources, based on defined resource requirements for a service);

destroying composite resources based on a Concrete Resource Model; and
any combination of these resource manager methods.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in Osborn's disclosure of a resource manager the ability to create and change composite resources in order to provide increased functionality to the resource manager and, in addition, to provide for more robust allocation of composite resources (Chellis; column 2 lines 44-67 and column 3 lines 1-6).

24. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osborn and Saylor, as applied to Claim 1 above, and in further view of U.S. Patent No. 5,151,984 to Newman et al. (hereinafter "Newman").

25. As to Claim 13, Osborn and Saylor disclose each and every limitation of Claim 1. Osborn and Saylor do not explicitly disclose, but Newman discloses wherein the step of using is executed according to an execution specification (Newman; column 53 lines 6-10, discloses a specification for execution).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Osborn's disclosure of the step of using to include executing according to an execution specification in order to control how the step of using is executed.

26. As to Claim 14, Osborn and Saylor disclose each and every limitation of Claim 1. Osborn and Saylor do not explicitly disclose, but Newman discloses wherein said execution specification is taken from a group of execution specifications consisting of:

execute immediately (Newman; discloses executing code immediately, see column 53 lines 6-10);

stored and executed later at least once (Newman; discloses storing and executing later, see column 53 lines 6-10); and

a combination of the above.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Osborn's disclosure of the step of using to include executing according to an execution specification in order to control how the step of using is executed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VIVEK KRISHNAN whose telephone number is (571) 270-5009. The examiner can normally be reached on Monday through Friday from 9:00 AM to 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Cardone can be reached on (571) 272-3933. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

VK

/Jason D Cardone/
Supervisory Patent Examiner, Art Unit 2145